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PHYSICAL PRODUCTION IN 1920

UPON the basis of the data available for computing the output of goods in the United States for 1920, inadequate as the data are, we present provisional estimates of both the amount and the course of last year's production. From these estimates, summarized for the year as a whole in Table I, and by shorter periods in

TABLE I. — INDICES OF PHYSICAL PRODUCTION, 1916-20

(Average for 1909-13 = 100)

	1916	1917	1918	1919	1920
Agriculture	100.4	108.5	107.1	109.1	118
Mining	129.5	134.5	135.6	110.8	128
Manufacture	127.7	125.6	125.0	114.0	115
Combined Index * . .	117.2	119.8	119.0	112.0	117

* The three constituent indices are weighted according to values of product ("value added" for manufacture) in 1909, that is, 36, 8, and 56, respectively.

Table II, it appears that during 1920 the course of production in mining was upward, while manufacture in general declined. For 1920 as a whole the output for both mining and manufacture exceeded that for 1919 and also the average for 1909-13, but was less than the output for 1916, 1917, and 1918. In agriculture, however, there was record production. Bumper crops brought the combined output of agriculture, mining, and manufacture almost to the high levels of 1917 and 1918. On the whole, then, it may be said that 1920 was a not unfavorable year with respect to the total volume of goods produced.

This conclusion is merely tentative for two reasons: the index is not adjusted for the growth element, and the figures for 1920 are based on fewer and in some cases on different commodities than are included in earlier years. To illustrate the first point by the indices for 1919, the unadjusted index of total production for that year is 112, while the adjusted index is 93;¹ that is, while the actual output in 1919 was 12 per cent more than the average for 1909-13, it was 7 per cent less than the "normal" to be expected from the rate at which production grew in the fifteen or more years before the war. Similarly, when allowance has been made for normal growth, the adjusted figure for 1920 may fall below normal.

In the second place, the present estimates for 1920 are based, except in the case of agriculture, upon fewer and upon different data than are the indices for other years. For agriculture, the same twelve crops as before are used: hay, corn, oats, wheat, barley, rye, buckwheat, potatoes, sugar, rice, cotton, and tobacco. For mining, only six of the ten minerals used in other years are represented; viz., bituminous and anthracite coal, coke, pig iron, copper, and petroleum; and of these, the coke series differs from other years by including only

beehive and not by-product coke. Since these six series together, however, have a weight of 46 out of 52 points in the mineral index, lack of data on gold, silver, lead, and zinc probably does not affect the result seriously. For manufacture, however, greater omissions and substitutions occur. No data for 1920 were available for certain industrial groups: as *liquors and beverages*; *stone, clay and glass products*; and *non-ferrous metals*. These three groups counted for about 13 per cent in the index of manufactures. On the other hand, the paper group which, for want of annual data, could not be included in the annual index prior to 1920 is represented this year by wood pulp production. Omissions without any offset, however, occur within certain groups. *Chemicals*, formerly represented by five series, and *vehicles*, represented by four, have each one series in 1920. In other groups, the full number of series appear, but not the same series as before. Under *food* in 1920, for example, live stock receipts at 7 markets are replaced by receipts at 60; wheat consumption is replaced by grain receipts at 17 centers; sugar supply by sugar meltings at 3 ports. Similar changes, though of a minor nature, occur in *textiles* and *lumber*; in fact, the only groups not altered in some degree are *iron and steel* and *tobacco*. Because of these differences in the data, the estimates for 1920 are only approximately a continuation of the Index of Physical Production previously published.

To secure, in addition to the indices for the year as a whole, estimates of the course of production during the year, figures were prepared which show for mining and manufacture the amount produced in the first half and in the second and third quarters of 1920 relative to one half and one quarter, respectively, of the 1919 output. The outstanding result of this computation is that mining on the whole increased steadily from the first half of 1919 through the last quarter of 1920, while manufacture showed a decided falling off in the third and fourth quarters of 1920. Among the minerals, the output of bituminous coal and petroleum increased most decidedly. The unparalleled demand both at home and abroad for petroleum and its products stimulated production, while the large export demand for coal, added to the domestic shortage left by the strike in 1919, required increased bituminous output also. Anthracite coal followed the course of bituminous, except in the third quarter of 1920, when the miners, dissatisfied with wage awards, quit work for several weeks. Unlike these three minerals, coke and copper showed a decline through the second half of 1920; a decline attributable in the case of copper to the cessation of a foreign market and the inactivity of a domestic market supplied by the government with salvaged war copper. Pig iron, the only other metal represented, slumped in the last quarter as copper had done, but its trend in 1920 was

¹ Edmund E. Day, "An Index of Physical Production," *REVIEW*, January, 1921, p. 20.

TABLE II. — INDICES OF PHYSICAL PRODUCTION FOR MINING AND MANUFACTURE IN 1919 AND 1920 *

(One-half of items for 1919 = 100 †)

Industry and series	1919		1920		
	Jan.-June	July-Dec.	Jan.-June	July-Sept.	Oct.-Dec.
MINING	97	102	113	118 †	119 †
Bituminous coal, estimated production	93	107	112	127	135
Anthracite coal, estimated production	91	109	104	99	111
Coke, beehive, estimated production	98	102	110	108	106
Pig iron, production	105	95	119	122	117
Copper, crude copper content of blister copper produced §	99	101	110	103	96
Petroleum, crude, marketed production	94	106	113	123	125
MANUFACTURE	95	104	106	99 †	89 †
I. Food:					
Cattle and calves, receipts at 60 markets	84	116	84	96	98
Hogs, receipts at 60 markets	113	87	106	70	97
Sheep, receipts at 60 markets	64	136	66	112	105
Grain, receipts of wheat, corn, oats, rye, and barley at 17 interior centers ‡	79	121	78	111	100
Sugar, meltings at the ports of New York, Boston, and Philadelphia	107	93	118	108	63
II. Textiles:					
Cotton, consumption	97	103	113	99	69
Wool, consumption	80	120	120	71	60
Fibers, imports of unmanufactured, including flax, hemp, Istle, jute, kapok, manila, New Zealand flax, sisal, and other	90	110	129	126	112
Silk, imports of raw	75	125	85	65	34
III. Iron and Steel:					
Pig iron, apparent consumption; i. e., production plus imports minus exports	105	95	120	123	118
IV. Lumber					
Lumber, reported cut of southern pine, western pine, Douglas fir, eastern white pine, North Carolina pine	92	108	114	110	86
VI. Paper:					
Wood pulp, production	98	102	115	108	112
VIII. Chemicals:					
Petroleum, crude, run of refineries	92	108	108	130	132
XI. Tobacco:					
Chewing, etc., production as indicated by sale of revenue stamps in the United States (excluding Porto Rico and Philippine Islands)	93	107	107	98	63
Cigars, etc., production as indicated by sale of revenue stamps in the United States (excluding Porto Rico and Philippine Islands)	93	107	118	118	110
Cigarettes, etc., production as indicated by sale of revenue stamps in the United States (excluding Porto Rico and Philippine Islands)	83	117	108	91	91
XII. Vehicles:					
Railway cars, output for domestic and foreign use	88	112	36	32	58

* The majority of the data may be found in the *Federal Reserve Bulletin*. The weights used are given in the REVIEW for December 1920, p. 341.

† The indices for the third and fourth quarters of 1920 are expressed as percentages of one-quarter of the items for 1919. The black figures are weighted geometric averages.

‡ The 17 interior centers are: Chicago, Cleveland, Detroit, Duluth, Indianapolis, Kansas City, Little Rock, Louisville, Memphis, Milwaukee, Minneapolis, Omaha, Peoria, St. Louis, Spokane, Toledo, and Wichita.

§ Data include the output of the largest companies in the United States, and represent about 95 per cent of total production.

upward through September. As in the case of bituminous coal, a domestic shortage caused by the 1919 strike, combined with larger export demands, resulted in a much higher output in 1920 than in 1919. Quantity produced increased, as we have said, from the first of the year through September, but in the last quarter, general fear of trade depression led to cancellation of orders, which at once resulted in reduced output. It is interesting to note that through 1919 and 1920 the correspondence which has been found to exist ordinarily

¹ For a study of the correlation between pig-iron production and manufacturing output, see *ibid.*, December, 1920, 367.

between pig iron production and manufacture is lacking.¹ Manufacture showed a steady increase from the first half of 1919 through the first half of 1920, while the steel strike caused a decline of pig iron output in the fall of 1919. Again, the decrease in manufacturing output began in the third quarter of 1920, while pig iron production increased in that quarter. The only agreement is in the decline of the last quarter of 1920.

The trend of manufacture in 1920 disagreed also, as stated above, with that of mining, in showing a decline rather than an increase in the third and fourth quarters of the year. It is not altogether safe to trace the de-

pression thus indicated to particular commodities, since no allowance has been made for the seasonal movement which doubtless exists for certain goods, such as livestock and grain receipts. It will be enough to point out the decreased output of silk, wool, and cotton in the second half of the year, and of sugar in the last quarter, following the drop in the markets of these goods. The curtailment in 1920 compared with 1919 in the produc-

tion of railway cars also deserves comment. Evidently the return of the roads to private ownership did not result in extensive buying of cars. The upward movements of pig-iron consumption and crude oil run reflect the conditions of pig iron and petroleum production already described. Their increased output is not enough, however, to offset the general slackening which took place in manufacture in the latter part of 1920.